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ABSTRACT

This abstract summarizes recent statistics on the prevalence and causes of traumatic brain injuries (TBI), the populations it affects, and the degree of disability it causes. Estimates are based on 1985-1987 data from the National Health Interview Survey, a household survey of the noninstitutionalized U.S. population. Analysis indicates: the overall incidence rate is 0.8 percent, with young males having the highest incidence rates of any group; an estimated 31 percent of TBI is caused by moving motor vehicles; half of TBI cases are severe enough to cause a disability; firearms are the most common cause of fatality due to TBI; and strategies to reduce TBI should concentrate on youth and younger adults. Three tables provide detailed data on: (1) annual number and incidence rate of TBI cases, by gender and age; (2) annual number and incidence rate of TBI cases, by class of accident and place of accident; and (3) types of injury causing greatest activity limitation. (DB)

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Disability Statistics Abstract

Number 14

The Incidence of Traumatic Brain Injury in the United States

by Joel Anton Forkosch, H. Stephen Kaye, and Mitchell P. LaPlante

An estimated 1.9 million Americans experience traumatic brain injury (TBI) each year.¹ About half of these cases result in at least short-term disability, and 52,000 people die as a result of their injuries.² The direct medical costs for treatment of TBI have been estimated at more than \$4 billion annually.³

This abstract summarizes data on the incidence and causes of TBI, the populations it affects, and the degree of disability it causes. Estimates are based on three years' (1985-87) data from the National Health Interview Survey (NHIS), a household survey of the non-institutionalized U.S. population. In the NHIS, respondents are asked about injuries they received during a two-week period prior to the interview, and their answers are used to provide annual incidence estimates. In addition, they are questioned about restrictions in

Eight out of every thousand persons experience a skull fracture or intracranial injury in any given year.

their normal activities during the same two-week reference period, caused by injuries received during the previous three months. For the purposes of this abstract, injuries classified as "skull fractures and intracranial injuries" are considered TBI, corresponding to International Classification of Diseases (ICD-9) codes 800-804 and 850-854.

Incidence Rates

The incidence rate for TBI is 0.8 percent (see Table 1), meaning that 8 out of every 1,000 persons experience a skull fracture or intracranial injury in any given year. The incidence rate is higher for men than women (0.9 versus 0.7 percent). Age is an even more significant factor in incidence rates, with the highest rates among youth (1.1 percent) and younger adults (0.9 percent).

Young males have the highest incidence rates of any group, with

those under 18 having a 1.6 percent chance of experiencing TBI in each year. Those between 18 and 44 years of age have an incidence rate of 0.8 percent.

Causes of TBI

An estimated 31.0 percent of traumatic brain injuries involve moving motor vehicles, making traffic accidents the largest single cause of TBI (see Table 2). Household accidents are the second-leading cause, accounting for 26.3 percent of cases. Workplace accidents are much less frequently cited.

Statistics on place of injury reveal the same pattern, with streets and highways (including sidewalks and adjacent areas) accounting for 33.1 percent of cases and private residences accounting for 26.3 percent. Schools, places of recreation, and

Traffic accidents and firearms are common causes of traumatic brain injury in young males.

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Table 1: Annual Number and Incidence Rate of TBI Cases, by Gender and Age, 1985-87.

	Number (thousands)	Incidence rate (percent)
Total	1,931	0.8
Gender		
Male	1,058	0.9
Female	872	0.7
Age		
0-18	685	1.1
18-44	881	0.9
44-64	205*	0.5*
65+	159*	0.6*

*Estimate has low statistical reliability—standard error exceeds 30 percent of estimate.

Source: 1985-87 National Health Interview Survey, tabulated in Collins, J.G., Types of Injuries by Selected Characteristics: United States, 1985-87. National Center for Health Statistics. Vital Health Stat 10(175). 1990.

industrial sites accounted for most of the remaining cases.

TBI as a Cause of Disability

While almost all (99.3 percent) of the reported cases of skull fractures and intracranial injuries are medically attended, only about half (49.2 percent) result in limitations in activity and about a third (36.8 percent) cause the person to be restricted to bed for at least half a day. Thus, only half of TBI cases are severe enough to cause any disability at all.

Nonetheless, TBI does cause significant short-term disability. On average, a traumatic brain injury causes 7.4 days of restricted activity, of which 3.0 are spent in bed. These figures rank TBI fourth among the most disabling categories of injury reported: only fractures of the neck, trunk, or upper limbs, fractures of the lower limbs, and dislocations cause more days of restricted

activity and bed disability, per injury, than TBI (see Table 3).

Although the NHIS does not permit analysis of long-term disability caused by TBI, it does indicate that a substantial number of Americans—the nearly 1 million each year who experience short-term activity limitation—are at risk for lingering and possibly disabling effects from their injuries.

Reducing the Incidence of TBI

The high incidence rates of TBI among youth and younger adults, especially males, suggests that strategies to reduce TBI should concentrate on that population. In addition, the large number of cases caused by traffic accidents points toward reducing such accidents and their severity. Other studies⁴ have concluded that one of the most significant causes of injury and fatality among those aged 15-24 is motor vehicle accidents related to alcohol consumption. A reduction

in the number of young adults who drink and drive would therefore result in a reduced incidence of TBI among that population.

Recent data indicate that firearms are the most common cause of fatality due to TBI.⁵ This phenomenon also disproportionately affects young males, suggesting another strategy for reducing the incidence of TBI.

The large proportion of cases occurring in the home and at school suggests that falls are a significant cause of TBI. Prevention and education efforts could also focus on improving home and school safety. In addition, a substantial number of cases are associated with recreational activities (possibly including those occurring on roadways but not involving motor vehicles), suggesting that the safety of such activities as bicycling, skating, and contact sports could be improved.

Table 2: Annual Number and Incidence Rate of TBI Cases, by Class and Place of Accident, 1985-87.

	Number (thousands)	Incidence rate (percent)
Total	1,931	0.8
Class of accident		
Moving motor vehicle	599	0.3
Household	507	0.2
Workplace	164*	0.1*
Other	730	0.3
Place of accident		
Street or highway	640	0.3
Residence	507	0.2
School	259*	0.1*
Place of recreation	176*	0.1*
Industrial site	73*	0.0*
Other	276*	0.1*

*Estimate has low statistical reliability—standard error exceeds 30 percent of estimate.

Source: 1985-87 National Health Interview Survey, tabulated in Collins, J.G., Types of Injuries by Selected Characteristics: United States, 1985-87. National Center for Health Statistics. Vital Health Stat 10(175). 1990.

Table 3: Types of Injury Causing Greatest Activity Limitation, 1985-87.

Type of injury	Average number of restricted-activity days	Average number of bed-disability days
Fractures of lower limb	24.1	9.5
Fractures of neck, trunk and upper limb	11.6	3.1
Dislocations	10.2	4.0
Skull fractures and intracranial injuries	7.4	3.0
Sprains and strains	6.6	1.7

Source: 1985-87 National Health Interview Survey, tabulated in Collins, J.G., Types of Injuries by Selected Characteristics: United States, 1985-87. National Center for Health Statistics. Vital Health Stat 10(175). 1990.

Notes

1. TBI incidence data in this abstract are obtained from Collins, J.G., *Types of Injuries by Selected Characteristics: United States, 1985-87*. National Center for Health Statistics. *Vital Health Stat* 10(175). 1990.
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Credits

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